OPTIMIZATION OF INJECTION MOLDING PARAMETER IN PROCESSING POLYPROPYLENE USING TAGUCHI METHOD

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Declaration by the Candidate

"I declare that this thesis is the result of my own work except the ideas and summaries which I have clarified their sources. The thesis has not been accepted for any degree and is not concurrently submitted in the candidature of any degree."

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Abstract

Nowadays, manufacturing industry is growing rapidly in any country over the world. Plastic industry is the one of the manufacturing industry that has high demand products to consumers. Polypropylene is popular due to its characteristics such as recycle, low cost, chemical resistance, excellent impact strength, food grade availability and so on. The plastic product were produced by using injection molding machine at different injection molding parameters. The quality of product depends on the optimization of the injection molding parameter that will be set for producing plastic product. Thus, the optimization of the injection molding parameter on processing polypropylene by using design of experiment is the main objective of the study. The shrinkage and cycle time fabrication of polypropylene were investigated. Shrinkage is inherent in the injection molding process. This is because the density of polymer was different from the processing temperatures compared to the ambient temperature. The best value of injection molding parameters such as melting temperature, injection pressure, injection speed, cooling time, holding time and holding pressure have been obtained and optimized. From the results obtained, the most significant injection molding parameter on shrinkage and cycle time fabrication of polypropylene is holding time. The result has been supported by analysis of variance (Anova). By using design of experiment method, it has eliminate the trial and error method and save time and money in development and processing the plastic product. The optimization of injection molding parameter contributes to the plastic processing such as increasing productivity, quality and reliability of the product. The surface morphology of specimen hard to see because the polypropylene is semi crystalline polymer.

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